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Connectors for use in EHV Substations must meet essentially the same electrical and mechanical requirements as those for other power connectors. However, operation at extra high voltages imposes an important additional requirement. They must not produce corona discharges that interfere with radio reception and cause energy loss.

Corona forms when the voltage gradient at the surface of a conducting material exceeds a critical value and ionizes the surrounding air. For conductors, the four basic factors that determine surface voltage gradient are distance from ground, conductor diameter, phase spacing and voltage.

In A.C. circuits, there are two basic kinds of corona. Negative corona forms during the negative half cycle, and positive corona during the positive half cycle. Negative corona generally appears as a glow on conventional conductors at about 20 kV rms/cm. Its amplitude is relatively low and causes no significant radio interference. Positive corona appears as a plume at above 30 kV rms/cm. Its amplitude is about 50 times higher than that for negative corona and is the major cause of radio interference.

Burndy EHV Connectors are designed so that under fair weather operating conditions, the voltage gradient at the connector surface will be at a level that will not cause corona and the resultant radio interference. (RIV)

BURNDY DESIGN CRITERIA

Cable Connectors

For reasons of economy, EHV systems using stranded conductor are generally designed to operate at voltage gradients close to the negative corona onset level. It is essential, therefore, that connectors provide corona-free performance superior to that of the cable. So our design criterion calls for the voltage at which corona extinguishes from the connector to be higher than the voltage at which it extinguishes from the cable. This criterion is met by eliminating all projections and by providing smooth contours on all surfaces. On compression elements, the ends are especially critical. Carefully deigned tapers are provided to keep the voltage gradient at a level lower than that on the conductor. Of course, it is still necessary during installation to smooth crimped elements.

On accessories, like spacers for bundled lines, the critical areas are those at the edges of the bundle. The bundle itself generally shields those parts that fall within it. Many projections that would cause corona on a single conductor line are quiet when they fall within the shielding influence of a bundle. However, those parts that fall at the edges are carefully finished at the factory to insure corona-free operation.

Tubular Bus Connectors

Station designers choose tubular bus sizes on the basis of mechanical rather than electrical requirements. For instance, stations that only need 4" IPS to meet electrical and corona requirements often have 6" IPS as main buses. The resultant voltage gradient on these buses is very low, perhaps only 10 kV rms/cm, well below the corona onset level.

It is impractical, therefore, to require that connectors operate quieter than the bus regardless of voltage. Under some circumstances, it might be impossible to meet such criteria. In most cases, it would be prohibitively expensive to do so.

Of course, theoretically optimum connectors could be designed for each application, based on the design voltage gradient for individual stations. However, in most cases even differences as great as that between 345 and 500 kV don't have a meaningful impact on connector costs. So, from a practical point of view, it is feasible to design most connectors for 500 kV operation. This makes it more convenient for station designers to select and order connectors.

Bus connectors are designed to provide corona-free performance under conditions of actual operation. This is done by calculating the voltage gradient on the surface of the bus at 500 kV, using the phase spacing and ground distance typical for this voltage. Connectors are then designed to operate corona free when the voltage gradient on the bus is 10% above this value.

The exceptions to this rule are the flexible expansion connectors. Those designed for 345 kV are self-shielding. Those for 500 kV have separate shielding rings. Experimental work on self-shielding 500 kV expansion connectors indicates that the margin of safety is too small to justify recommending them for this voltage.

CONTROLLING CORONA

Since corona is caused when the voltage gradient at the surface of a conducting material reaches a level that causes the surrounding air to break down, then obviously, the way to prevent corona is to keep the gradient below this critical level.

From the point of view of the connector designer, this can be accomplished in three ways:

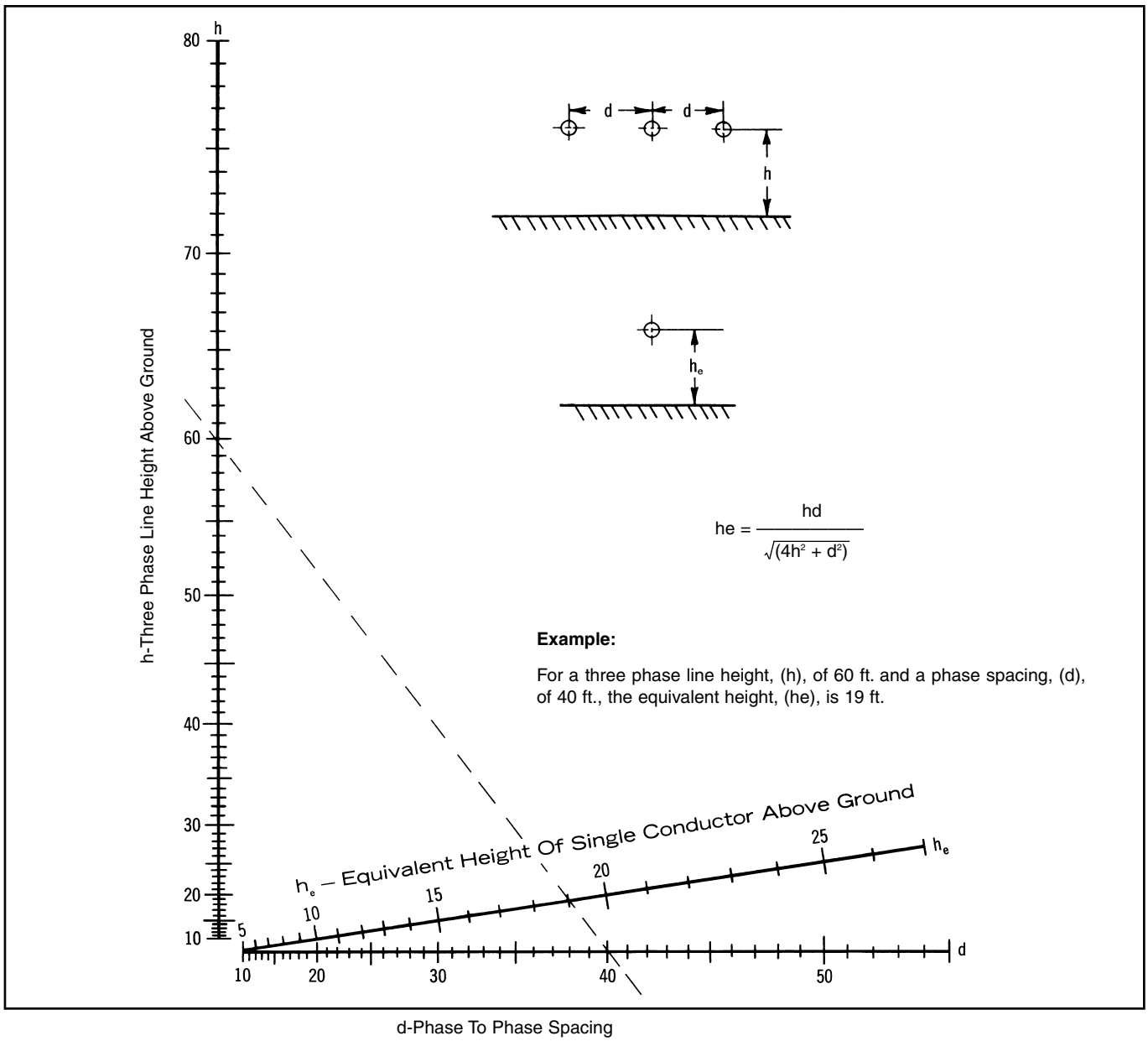
1. By providing generous radii on all outside surfaces to keep the voltage stresses to a minimum.
2. By providing shielding rings.
3. By placing the connector within the shielding influence of some part of the bus structure.

Since it is impossible for the connector designer to know the exact configuration of every bus system where the connectors might be used, the third approach is not practical. So, for purposes of developing a standard line, we concentrate on the first two.

Whenever possible, connectors are designed to be self-shielding. This approach leads to less costly and less obstrusive designs. Only in the case of complicated connector configurations do Burndy EHV designs use corona rings. Examples of such applications are disconnectable equipment taps, expansion couplers and equipment terminals which often have configurations that preclude the use of self-shielding designs.

NOMOGRAM FOR DETERMINING THE EQUIVALENT

HEIGHT (he) OF A THREE PHASE LINE



$$he = \frac{hd}{\sqrt{(4h^2 + d^2)}}$$

Example:

For a three phase line height, (h), of 60 ft. and a phase spacing, (d), of 40 ft., the equivalent height, (he), is 19 ft.

Nomogram for determining the equivalent height of a single conductor line having the same average voltage of gradient as the CENTER conductor of a horizontally spaced three phase line, with the same line to ground voltage and the same conductor size. All dimensions measured in the same units.

The use of the laboratory is based on the fact that it is the surface voltage gradient that causes corona. Although most systems consist of 3 phase conductors and a ground plane, it is a rather simple matter to duplicate in the laboratory the conductor surface voltage gradient as it exists on any of these phase conductors with a single conductor and a ground plane.

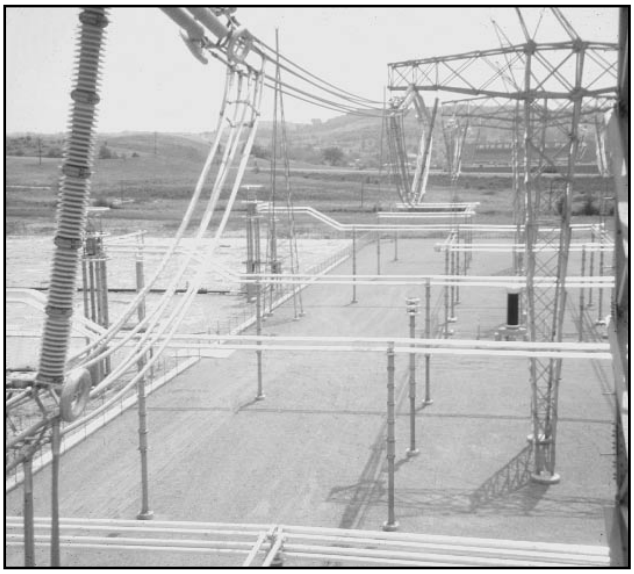
The following formulae and nomograms give this three phase to single phase equivalency. Because this conversion is possible, all EHV testing is done single phase; and there is no necessity for 3 phase testing with its high cost in terms of equipent and space.

Since voltage gradient is the significant factor, the single phase test does not have to be done at the full voltage of an operation system. By setting up the test closer to the ground plane, the operation voltage gradient can be obtained with a lower test voltage. There is a limit, however, below which the height cannot be lowered lest corona onset and flashover occur simultaneously. Generally, the minimum test height should be about 10 times the diameter of the test conductor.

GRADIENT CALIBRATOR

Normally, the conductor surface voltage gradient at the extinction of corona in the laboratory is calculated using the accompanying equations. However, for test setups involving unusual conductor configurations, the conductor gradient cannot be readily calculated. In these cases, a gradient calibrator may be used. This is a small sphere mounted on the conductor. It has previously been calibrated for each conductor size to establish the surface voltage gradient that starts positive corona on the sphere. With it tests can be duplicated in any number of laboratories. The applied voltages and ground distances could all be different. But the voltage gradient on the surface of the conductor when the corona occurs on the sphere will always be the same. The calibrator provides a convenient bench mark for measuring the corona performance of connectors.

In use, the sphere is mounted on the conductor in a connector test setup. The voltage is raised until there is a corona on the sphere. We already know from previous calibration what the voltage gradient on the surface of the conductor is at this point.



The sphere is removed and the voltage raised until there is a corona on the connector. Since the voltage gradient increases directly with increases in applied voltage, the gradient on the conductor at this point can be readily calculated.

It is important to note that the significant parameter is the voltage gradient on the surface of the conductor. It is not necessary to know the gradient on the connector. The conductor gradient in any given substation is controlled by its design parameters and may be calculated using the following formulae and nomograms. Once the gradient is known, it is unnecessary to have any other information to design connectors. As long as connectors are corona-free at a conductor voltage gradient higher than that planned for the conductor, the connector will be corona-free under fair weather operating conditions.

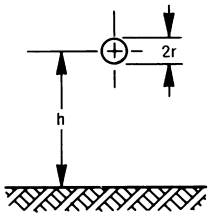
There may on occasion be unusual situations where choice of *conductor*, station geometry or clearance problems cause the need for connectors of special design. Where this is the case, Burndy is prepared to design corona-free devices to operate under such conditions.

Formulae for Determining The Voltage Gradient

Notations Used

h = line to ground distance (cm)
r = radius of the individual conductor (cm)
s = conductor spacing in the bundle (cm)
d = phase to phase spacing of the line (cm)
V = line to ground voltage (kV)
E_a = average gradient at the surface of the conductor (kV/cm)
E_m = maximum gradient on the surface of a single conductor
h_e = equivalent single phase line to ground distance (cm)
r_e = equivalent single conductor radius (cm) of bundled conductors
n = number of conductors in the bundle

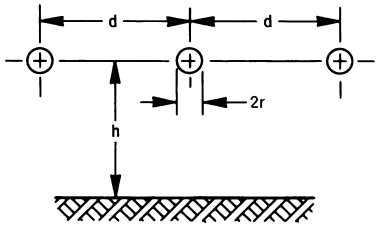
Single Conductor - Single Phase



$$E_a = \frac{V}{r \ln \frac{2h}{r}} \qquad E_m = \frac{h}{h - r} E_a$$

The maximum gradient (E_m) occurs on the side facing the ground plane.

Single Conductor - Three Phase

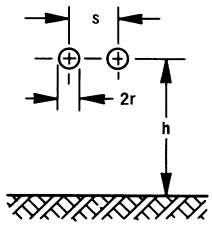


The center conductor has a gradient about 5% higher than the outside conductors. The gradient on the center phase may be calculated using the formulae for the single conductor.
Single phase system and substituting (h_e) from the following formula or attached nomograms for the height above ground (h). For the center phase:

$$E_a = \frac{V}{r \ln \frac{2h_e}{r}} \qquad h_e = \frac{hd}{\sqrt{(4h^2 + d^2)}}$$

It should be noted that h_e is somewhat smaller than $\frac{d}{2}$

Bundled Conductor - Single Phase



$$E_a = \frac{V}{n\, r \ln \frac{2h}{r_e}} \qquad \text{in which } r_e = r\left(\ell \frac{s}{r}\right)^{\frac{n-1}{n}}$$

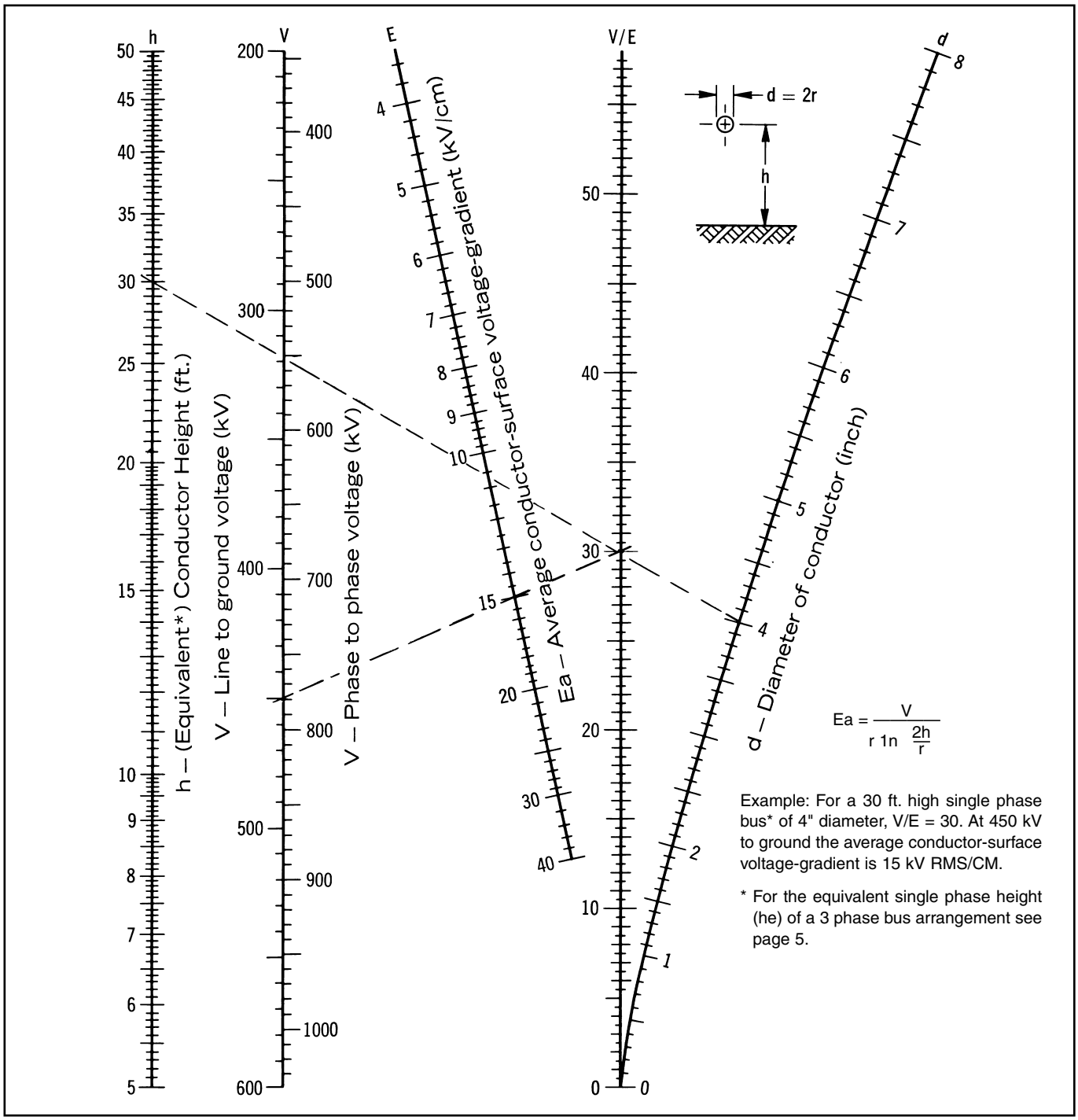
The value of "ℓ" is unity for 1-, 2-, and 3- conductor bundles and 1.12 for 4- conductor bundles.

Bundled Conductor - Three Phase

This case may be reduced to the single bundled conductor case by replacing h with h_e in the equation. The definition of h_e is identical to that given for the single conductor — three phase situation.

Fig. 1

NOMOGRAM FOR FINDING THE AVERAGE CONDUCTOR-SURFACE VOLTAGE-GRADIENT FROM LINE DIMENSIONS AND VOLTAGE.



Example: For a 30 ft. high single phase bus* of 4" diameter, V/E = 30. At 450 kV to ground the average conductor-surface voltage-gradient is 15 kV RMS/CM.

* For the equivalent single phase height (he) of a 3 phase bus arrangement see page 5.

RADIO INTERFERENCE VOLTAGE

There is serious question as to whether measurement of RIV on connectors makes a meaningful contribution to quieter station operation.

Under test conditions, there is generally no significant indication on the radio noise meter until the onset of visible positive corona. At this point, the RIV reading goes into the hundreds of thousands of microvolts. The effect of this phenomenon is to provide a visibly discernable point at which RIV will become excessive. It eliminates the necessity to make, record and plot RIV measurements. Where there is no corona, there is no RIV. So our test criterion calling for no visible corona insures that there will be no radio interference generated by the connector under operating conditions.

EFFECT OF CONDUCTOR SIZE ON TESTING

Conductor diameter has a significant effect on potential corona problems. The larger the diameter, the lower the surface voltage gradient for a given test voltage. This means that smaller conductors produce corona at lower voltages than larger ones.

Many connector designs have the same basic configuration for various conductor sizes. The only difference being the size of the attaching elements. This is particularly true for many of the welded type connectors. Where this is the case, it is often sufficient to test the connector only on the smallest conductor, since it yields the lowest corona extinction voltage. When there is any doubt, each size is tested.

CONTAMINATION

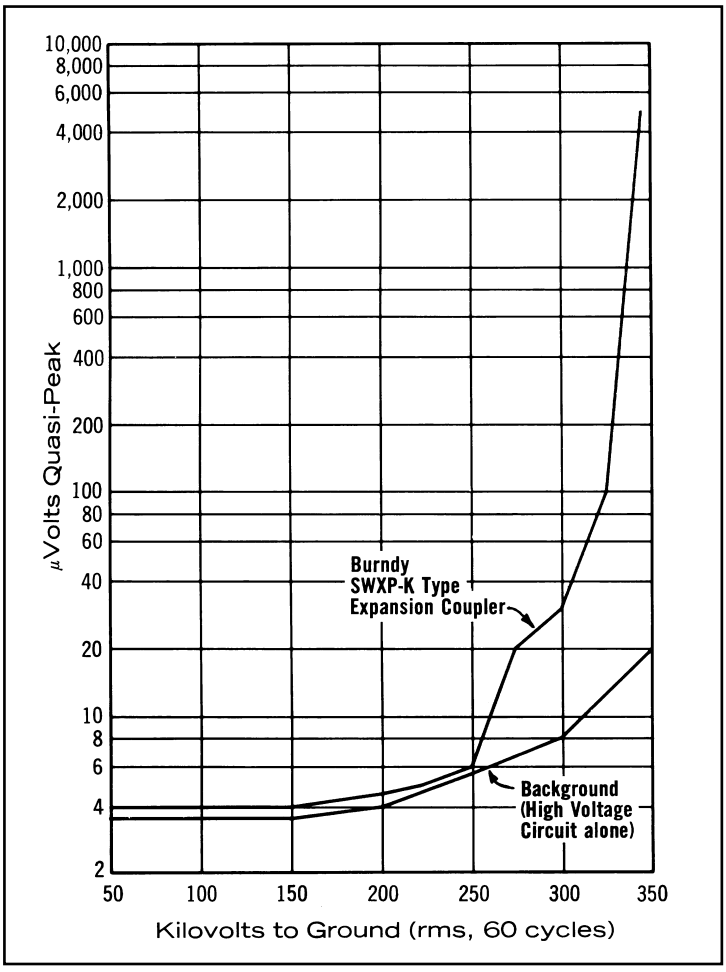
Much work has been done to establish the relationship between the corona onset voltage for contaminated as compared to clean hardware. Experiments in the Burndy laboratory indicate that this value can be reduced to half of the voltage for clean hardware. However, the relationship varies with the kind of contamination, atmospheric condition and type of connector.

There have been a number of attempts to produce artifical contamination and atmospheres in laboratories. However, there is as yet no clearly established relationship between the corona performance of hardware contaminated in the laboratory. Until such a relationship is established, the only testing that provides comparable data is on clean hardware under fair weather conditions.

CONCLUSION

For almost 70 years, Burndy has been designing connectors for the industry's most critical applications. Connectors for EHV are an outgrowth of this tradition. Whether your need is for catalog items or special designs, you can count on electrical, mechanical and corona-free performance, commensurate with the application.

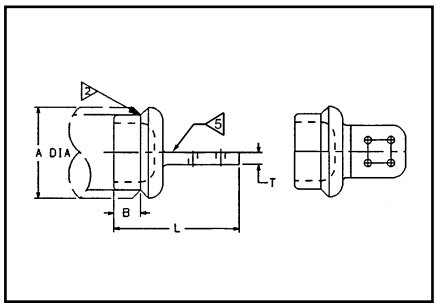
TYPICAL CURVE

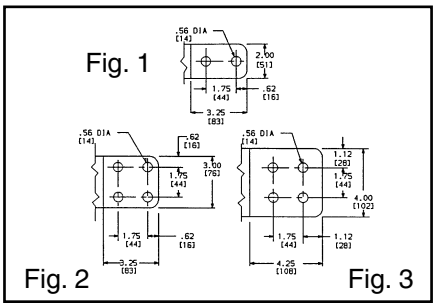


TYPE SWAC-A-N

WELDED TERMINALS

Aluminum alloy streamlined; weld type terminal. Type SWAC has one contact surface on the centerline of the tube. Self-shielding up to 550 kV with the use of STS shields. Penetrox joint compound recommended for use on contact surfaces.





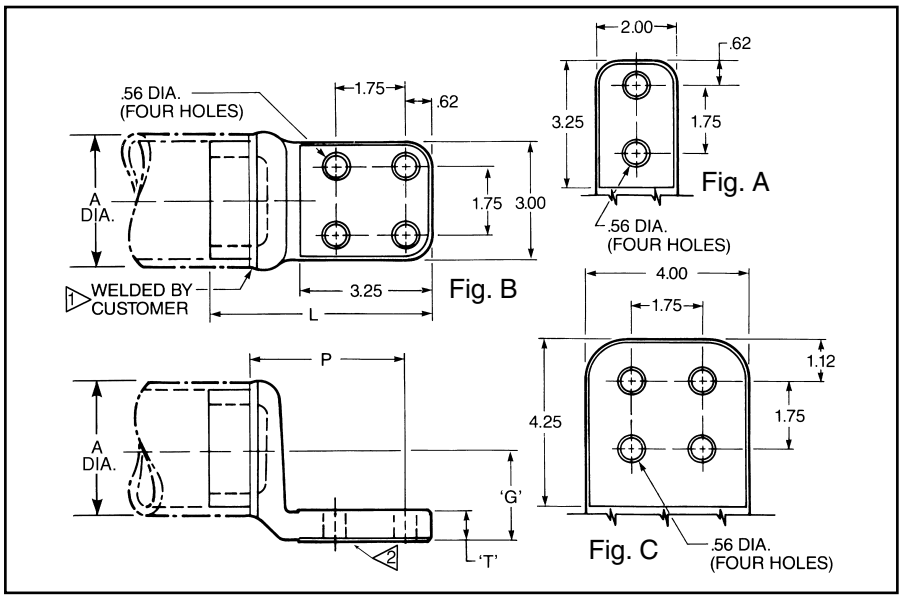
CONDUCTOR		DIMENSIONS IN/[mm]				CATALOG NUMBER	
IPS	A	FIG.	B	L	T	IPS (SCHD40)	EHPS (SCHD80)
2"	2.38 [60]	1	1.25 [32]	5.80 [147]	.50 [13]	SWAC18A-2N	SWAC58A-2N
		2	1.25 [32]	5.80 [147]	.50 [13]	SWAC18A-34N	SWAC58A-34N
		3	1.25 [32]	6.86 [174]	.50 [13]	SWAC18A-44N	SWAC58A-44N
2-1/2"	2.88 [73]	1	1.50 [38]	6.23 [158]	.56 [14]	SWAC19A-2N	SWAC59A-2N
		2	1.50 [38]	6.23 [158]	.56 [14]	SWAC19A-34N	SWAC59A-34N
		3	1.50 [38]	7.29 [185]	.56 [14]	SWAC19A-44N	SWAC59A-44N
3"	3.50 [89]	1	1.75 [44]	6.30 [160]	.62 [16]	SWAC20A-2N	SWAC90A-2N
		2	1.75 [44]	6.30 [160]	.62 [16]	SWAC20A-34N	SWAC90A-34N
		3	1.75 [44]	7.36 [187]	.62 [16]	SWAC20A-44N	SWAC90A-44N
3-1/2"	4.00 [102]	2	1.75 [44]	6.30 [160]	.62 [16]	SWAC21A-34N	SWAC91A-34N
		3	1.75 [44]	7.36 [187]	.62 [16]	SWAC21A-44N	SWAC91A-44N
4"	4.50 [114]	2	2.00 [51]	6.40 [163]	.75 [14]	SWAC22A-34N	SWAC92A-34N
		3	2.00 [51]	7.40 [188]	.75 [19]	SWAC22A-44N	SWAC92A-44N
4-1/2"	5.00 [127]	2	2.00 [51]	6.23 [158]	.56 [19]	SWAC23A-34N	SWAC93A-34N
5"	5.56 [141]	2	2.00 [51]	6.68 [170]	.75 [19]	SWAC24A-34N	SWAC94A-34N
		3	2.00 [51]	7.72 [196]	.75 [19]	SWAC24A-44N	SWAC94A-44N
6"	6.62 [168]	3	2.50 [64]	7.75 [197]	1.00 [25]	SWAC86A-44N	SWAC96A-44N

NOTES:
1. MATERIAL: CAST ALUMINUM ALLOY.
2. WELDING TO BE DONE BY THE CUSTOMER. FOR WELDING RECOMMENDATION SEE DRAWING SD73608.
3. AFTER WELDING, SCRATCH BRUSH CONNECTOR CONTACT SURFACE DRY THEN APPLY ON OXIDE INHIBITOR “PENETROX A”. “PENETROX A” CAN BE PURCHASED FROM BURNDY CORPORATION IN CANS OR PLASTIC SQUEEZE BOTTLES.
4. USE IN CONJUNCTION WITH STS CAPS FOR EHV APPLICATIONS. (REFERENCE: SC58521)
5. TONGUE FINISHED ON ONE SIDE ONLY ON CENTERLINE OF TUBING. FOR TONGUE FINISHED ON BOTH SIDES, ADD SUFFIX LETTER "Q" TO CATALOG NO., E.G. SWAC24A-44NQ.
6. DIMENSIONS IN BRACKETS [ ] ARE IN MILLIMETERS.

TYPE SWA-A-N

WELDED TERMINAL OFFSET

Aluminum alloy streamlined, welded offset terminal. Self-shielding up to 550 kV with the use of STS shielding caps. Penetrox joint compound recommended for use on terminal contact surfaces.



ACCOMMODATES 'A' DIA ALUMINUM TUBE	CATALOG NO.		FIG. NO.	G	L	P		T
	SCH40	SCH80				IPS	EHPS	
2" (2.375 DIA.)	**SWA18A-2N**	**SWA58A-2N**	A	1.72	5.88	4.25	4.30	.50
	SWA18A-34N	**SWA58A-34N**	B	1.72	5.88	4.25	4.30	.50
	SWA18A-44n	**SWA58A-44N**	C	1.72	6.95	4.82	4.87	.50
2-1/2" (2.875 DIA.)	**SWA19A-2N**	**SWA59A-2N**	A	1.97	6.36	4.36	4.41	.56
	SWA19A-34N	**SWA59A-34N**	B	1.97	6.36	4.36	4.41	.56
	SWA19A-44N	**SWA59A-44N**	C	1.97	7.40	4.92	4.97	.56
3" (3.500 DIA.)	**SWA20A-2N**	**SWA90A-2N**	A	2.34	6.41	4.39	4.47	.62
	SWA20A-34N	**SWA90A-34N**	B	2.34	6.41	4.39	4.47	.62
	SWA20A-44N	**SWA90A-44N**	C	2.34	7.46	4.94	5.05	.62
3-1/2" (4.000 DIA.)	**SWA21A-34N**	**SWA91A-34N**	B	2.59	6.40	4.39	4.53	.62
	SWA21A-44N	**SWA91A-44N**	C	2.59	7.47	4.96	5.10	.62
4" (4.500 DIA.)	**SWA22A-44N**	**SWA92A-44N**	C	2.84	7.51	5.00	5.16	.75
4-1/2" (5.000 DIA.)	**SWA23A-44N**	**SWA93A-44N**	C	3.09	7.77	5.03	5.16	.75
5" (5.563 DIA.)	**SWA24A-34N**	**SWA94A-34N**	B	3.38	6.80	4.51	4.65	.75
	SWA24A-44N	**SWA94A-44N**	C	3.38	7.82	5.07	5.25	.75
6" (6.625 DIA.)	**SWA86A-44N**	**SWA96A-44N**	C	4.00	7.90	5.17	5.36	1.00

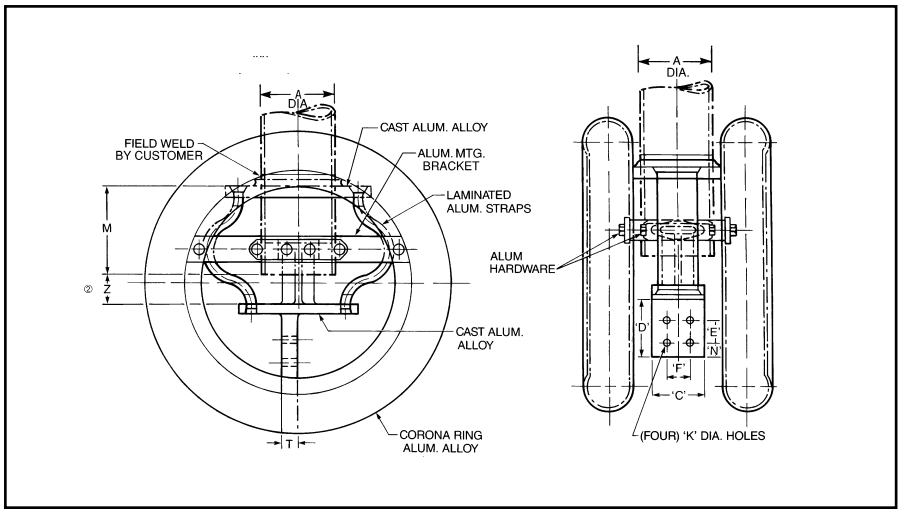
Note: All pads are NEMA drilled.

1. For welding recommendations, see drawing SD73608.
2. Tongue finished on one side only (bottom). For tongue finished on both sides, add suffix letter "Q" to catalog no., e.g. SWA22A-44NQ.

TYPE SWXA-A-N

WELDED EXPANSION TERMINAL

Aluminum alloy welded type expansion terminal for use at voltages up to 550 kV. Supplied complete with corona rings that shield assembly. Flexible element is laminated aluminum strap. Pads are 4 hole NEMA drilled. Penetrox joint compound recommended for terminal contact surfaces.



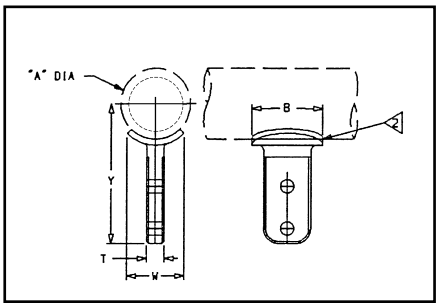
ACCOMMODATES 'A' DIA ALUMINUM TUBE	CATALOG NO.	C	D	E	F	K	M	N	T	TOTAL ② MOVEMENT	INSTALLATION DATA ①	
											BUS. TEMP.OF	Z ②
3" (3.500 DIA.) SCH 40	**SWXA20A-4N**	4.30	3.00	1.75	1.75	.56	7.87	.62	.75	2.00	-20	2.50
4" (4.500 DIA.) SCH 40	**SWXA22A-4N**	5.25	3.00	1.75	1.75	.56	9.56	.62	.86		-10	2.61
5" (5.563 DIA.) SCH 40	**SWXA24A-4N**	6.30	3.00	1.75	1.75	.56	10.77	.62	.81		0	2.32
6" (6.625 DIA.) SCH 40	**SWXA86A-4N**	7.62	4.50	1.75	1.75	56	11.63	1.12	1.00		10	2.21
4" (4.500 DIA.) SCH 80	**SWXA92A-4N**	5.25	3.00	1.75	1.75	.56	9.56	.62	.86		20	2.14
5" (5.563 DIA.) SCH 80	**SWXA94A-4N**	6.50	3.00	1.75	1.75	.56	10.77	1.12	.86		30	2.04
											40	1.95
											50	1.86
											60	1.77
											70	1.68
											80	1.57
											90	1.50
											100	1.41
											110	1.32
											120	1.23
											130	1.14
											140	1.04
											150	.95
											160	.86
											170	.77
											180	.68
											190	.59
											200	.50

Notes:
① Table is based on 60ft. max BUS run.
② All pads are NEMA drilled.

TYPE SWAB-A-N

WELDED TAP

Aluminum alloy streamlined weld type T-connector for making taps where future disconnects may be required. Self-shielding at voltages up to 550 kV when STS caps are used to shield terminal hardware. Penetrox joint compound recommended for terminal contact surfaces.



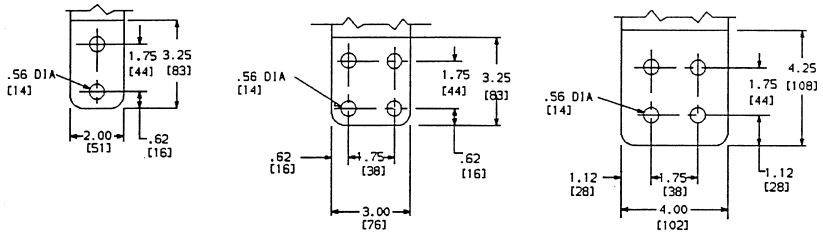


Fig. 1 Fig. 2 Fig. 3

CAT NO.	COMPLETE RANGE ALUM. TUBE	FIG NO.	DIMENSIONS IN/ [mm]					
			B	T	W	ALUM. IPS PIPE		
						NOMINAL	A	Y
SWAB19A-2N	1" TO 2 1/2"	1	3.00 [76]	.38 [10]	1.32 [34]	1"	1.32 [34]	4.45 [113]
						1-1/4"	1.66 [42]	4.67 [119]
						1-1/2 "	1.90 [48]	4.80 [122]
						2"	2.38 [60]	5.08 [129]
						2-1/2 "	2.88 [73]	5.32 [135]
SWAB19A-34N	1" TO 2 1/2"	2	4.00 [102]	.50 [13]	1.32 [34]	1"	1.32 [34]	4.45 [113]
						1-1/4 "	1.66 [42]	4.67 [119]
						1-1/2 "	1.90 [48]	4.80 [122]
						2"	2.38 [60]	5.08 [129]
						2-1/2 "	2.88 [73]	5.32 [135]
SWAB22A-2N	2 1/2" TO 4"	1	3.00 [76]	.75 [19]	2.40 [61]	2-1/2 "	2.88 [73]	5.25 [133]
						3"	3.50 [89]	5.62 [143]
						3-1/2 "	4.00 [102]	5.92 [150]
						4"	4.50 [114]	6.21 [158]

TYPE SWAB-A-N CONTINUED

CAT NO.	COMPLETE RANGE ALUM. TUBE	FIG NO.	DIMENSIONS IN/ [mm]					
			B	T	W	ALUM. IPS PIPE		
						NOMINAL	A	Y
SWAB22A-34N	2 1/2" TO 4"	2	4.00 [102]	.75 [19]	2.40 [61]	2	2.88 [73]	5.25 [133]
						3"	3.50 [89]	5.62 [143]
						3-1/2"	4.00 [102]	5.92 [150]
						4"	4.50 [114]	6.21 [158]
SWAB22A-44N	2 1/2" TO 4"	3	4.50 [114]	.75 [19]	2.40 [61]	2-1/2"	2.88 [73]	6.44 [164]
						3"	3.50 [89]	6.75 [171]
						3-1/2"	4.00 [102]	7.00 [178]
						4"	4.50 [114]	7.25 [184]
SWAB86A-2N	3" TO 6"	1	3.00 [76]	1.00 [25]	2.62 [67]	3"	3.50 [89]	5.58 [142]
						-1/2"3	4.00 [102]	6.08 [154]
						4"	4.50 [114]	6.36 [162]
						4-1/2"	5.00 [127]	6.36 [162]
						5"	5.56 [141]	6.67 [169]
						6"	6.62 [168]	7.24 [184]
SWAB86A-34N	3" TO 6"	2	4.00 [102]	1.00 [25]	2.62 [102]	3"	3.50 [89]	5.58 [142]
						3-1/2"	4.00 [102]	5.83 [148]
						4"	4.50 [114]	6.08 [154]
						4-1/2"	5.00 [127]	6.36 [162]
						5"	5.56 [141]	6.67 [169]
						6"	6.62 [168]	7.24 [184]
SWAB86A-44N	3" TO 6"	3	4.50 [114]	1.00 [25]	2.62 [102]	3"	3.50 [89]	6.81 [173]
						3"	4.00 [102]	7.06 [179]
						4"	4.50 [114]	7.31 [186]
						4"	5.00 [127]	7.56 [192]
						5"	5.56 [141]	7.84 [199]
						6"	6.62 [168]	8.37 [213]

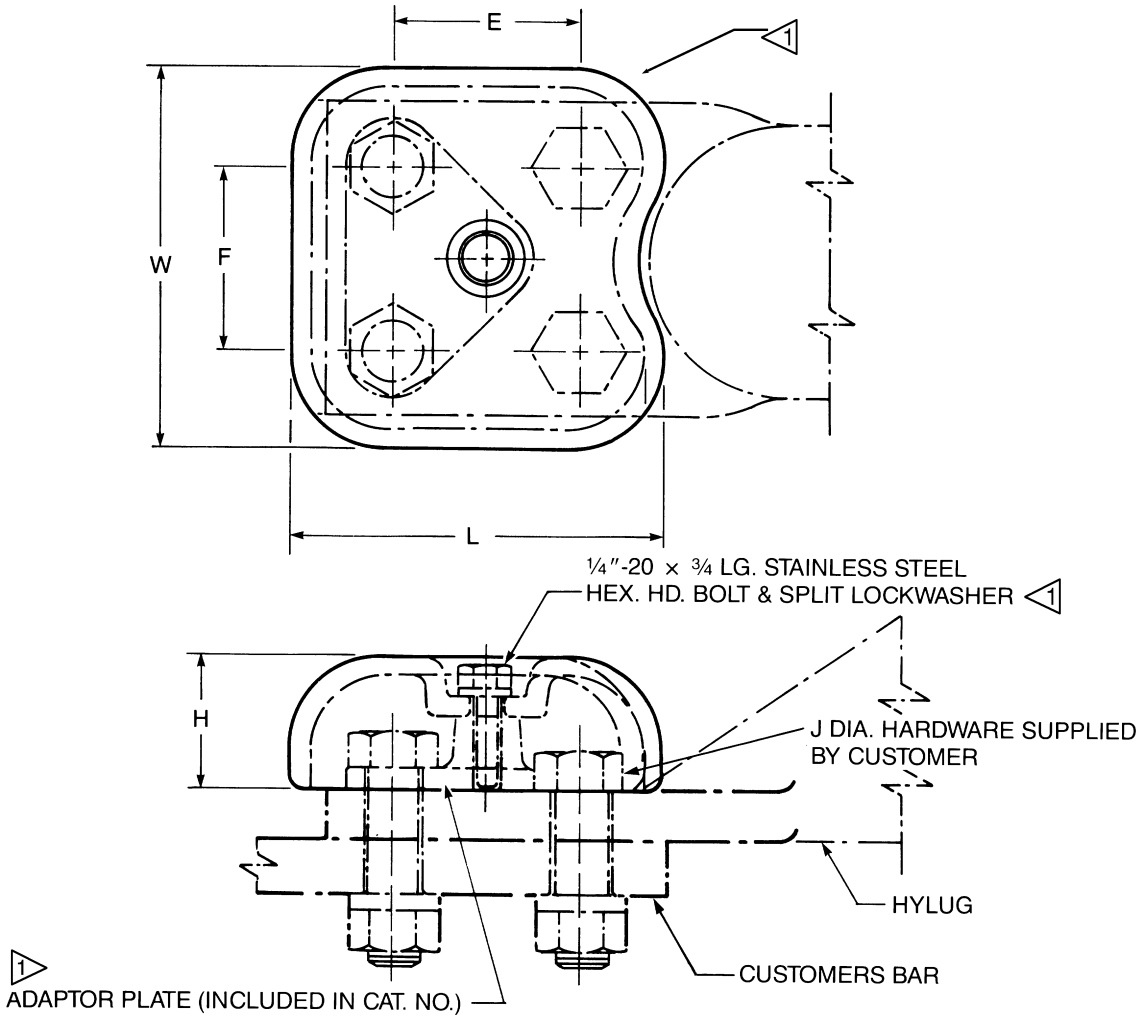
NOTES:

1. MATERIAL: CAST ALUMINUM ALLOY
2. WELDING TO BE DONE BY THE CUSTOMER. FOR WELDING RECOMMENDATION SEE DRAWING SD73608.
3. AFTER WELDING, SCRATCH BRUSH CONNECTOR CONTACT SURFACE DRY THEN APPLY AN OXIDE INHIBITOR “PENETROX A”. “PENETROX A” CAN BE PURCHASED FROM BURNDY CORPORATION IN CANS OR PLASTIC SQUEEZE BOTTLES.
4. USE IN CONJUNCTION WITH TYPE STS CAPS FOR EHV APPLICATIONS. (REFERENCE: SC58521)
5. DIMENSIONS IN BRACKETS [ ] ARE IN MILLIMETERS.

TYPE STS-A-N

TERMINAL PAD CAP

Aluminum alloy streamlined caps for shielding hardware when bolting terminals to flat pads singly or back to back. Caps are for 4 hole NEMA tongues. Adapter is attached with terminal hardware and shielding cap is fastened to adapter with stainless steel cap screws.



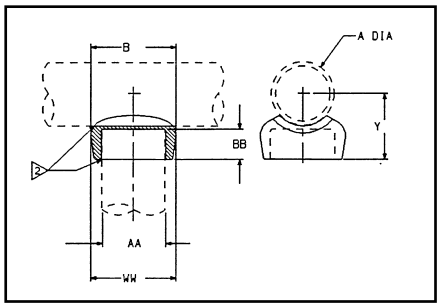
CATALOG NO. 1	E	F	H	J. DIA.	L	W	MAX. SHIELDED AREA
STS33A-4N	1.75	1.75	1.25		3.48	3.62	3 x 3
STS43A-4N	1.75	1.75	1.31		3.36	4.50	4.00 x 3.12
STS44A-4N	1.75	1.75	1.25		4.50	4.62	4 x 4

1 Catalog number includes one pad cap, one adapter plate, and stainless steel adaptor hardware.

TYPE SWT-A-A

WELDED T-CONNECTOR

Aluminum alloy streamlined, weld type T-connector, self-shielding at voltages up to 550 kV. Tap element is deep enough to allow for error in cut-off. Uses longitudinal weld on run, circumferential on tap. For standard (Schedule 40) and extra heavy (Schedule 80) Aluminum Tube.



RUN 'A' ALUMINUM TUBE	TAP 'AA' ALUMINUM TUBE		CATALOG NUMBER	RUN DATA		DIMENSIONS IN/ [mm]				
	TUBE	AA		NOM.TUBE	A	B	BB	W	WW	Y
3/4" TO 1-1/2"	3/4"	1.05 [28]	SWT17A14A	3/4"	1.05 [27]	2.12 [54]	.75 [19]	1.75 [44]	1.68 [43]	1.47 [37]
				1"	1.32 [34]					1.66 [42]
				1-1/4"	1.66 [42]					1.86 [47]
				1-1/2"	1.90 [48]					2.00 [51]
1" TO 1-1/2"	1"	1.32 [42]	SWT17A15A	1"	1.32 [34]	2.38 [54]	.75 [19]	2.00 [51]	1.94 [49]	1.62 [41]
				1-1/4"	1.66 [42]					1.85 [47]
				1-1/2"	1.90 [48]					2.00 [51]
1-1/4" TO 1-1/2"	1-1/4"	1.66 [27]	SWT17A16A	1-1/4"	1.66 [42]	2.69 [68]	1.00 [25]	2.38 [60]	2.25 [57]	2.08 [53]
				1-1/2"	1.90 [48]					2.21 [56]
1-1/2"	-1/2"	1.90 [48]	SWT17A17A	1-1/2"	1.90 [48]	3.19 [81]	1.00 [25]	2.64 [67]	2.52 [64]	2.16 [55]
2-1/2"	2-1/2"	2.88 [27]	SWT19A19A	2-1/2"	2.88 [73]	4.00 [54]	1.38 [35]	3.78 [96]	3.78 [96]	3.02 [37]
2" TO 3-1/2	3/4"	1.05 [28]	SWT21A14A	2"	2.38 [60.4]	2.12 [54]	.75 [19]	1.75 [44]	1.64 [42]	2.13 [54]
				2-1/2"	2.88 [73]					2.47 [42]
				3"	3.50 [89]					2.84 [72]
				3-1/2"	4.00 [102]					3.12 [51]
	1"	1.32 [34]	SWT21A15A	2"	2.38 [60.4]	2.38 [60.4]	.75 [19]	2.28 [60]	1.88 [48]	2.12 [54]
				2-1/2"	2.88 [73]					2.50 [64]
				3"	3.50 [89]					2.87 [73]
				3-1/2"	4.00 [102]					3.16 [80]
	1-1/4"	1.66 [42]	SWT21A16A	2"	2.38 [60.4]	2.69 [68]	1.00 [25]	2.36 [60]	2.26 [57]	2.38 [60]
				2-1/2"	2.88 [73]					2.76 [70]
				3"	3.50 [89]					3.14 [80]
				3-1/2"	4.00 [102]					3.42 [87]

TYPE SWT-A-A (CONTINUED)

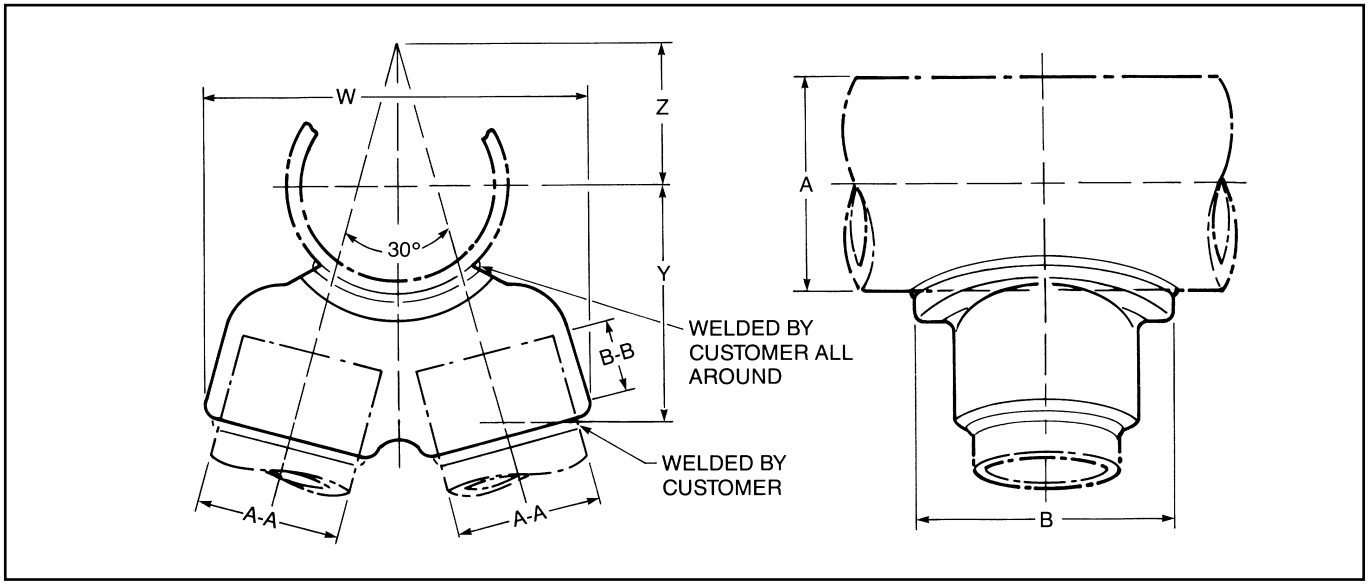
RUN 'A' ALUMINUM TUBE	TAP 'AA' ALUMINUM TUBE		CATALOG NUMBER	RUN DATA		B	BB	W	WW	Y
	TUBE	AA		NOM.TUBE	A					
2" TO 3-1/2"	1-1/2"	1.90 [48]	SWT21A17A	2"	2.38 [60.4]	3.19 [81]	1.00 [25]	2.62 [67]	2.52 [64]	2.35 [60]
				2-1/2"	2.88 [73]					2.75 [70]
				3"	3.50 [89]					3.14 [80]
				3-1/2"	4.00 [102]					3.43 [87]
2" TO 3-1/2"	2"	2.38 [60.4]	SWT21A18A	2"	2.38 [60.4]	4.00 [102]	1.00 [25]	3.33 [84]	3.00 [76]	2.40 [61]
				2-1/2"	2.88 [73]					2.71 [69]
				3"	3.50 [90]					3.07 [78]
				3-1/2"	4.00 [102]					3.34 [85]
2-1/2" TO 3-1/2"	2-1/2"	2.88 [73]	SWT21A19A	2-1/2"	2.88 [73]	4.00 [102]	1.38 [35]	3.78 [96]	3.68 [93]	3.02 [77]
				3"	3.50 [90]					3.40 [86]
				3-1/2"	4.00 [102]					3.70 [94]
2" TO 3-1/2"	3"	3.50 [90]	SWT21A20A	3"	3.50 [102]	4.56 [116]	1.38 [35]	4.52 [115]	4.34 [110]	3.33 [87]
				3-1/2"	4.00 [102]	4.56 [116]	1.38 [35]	4.52 [115]	4.34 [110]	3.70 [55]
4"	2"	2.38 [60.4]	SWT22A18A	4"	4.50 [114]	4.00 [102]	1.00 [13]	3.50 [102]	3.00 [76]	3.45 [87]
	2-1/2"	2.88 [73]	SWT22A19A			4.00 [102]	1.38 [35]	4.80 [122]	3.70 [94]	3.83 [97]
	3"	3.50 [102]	SWT22A20A			4.56 [116]	1.38 [35]	4.50 [114]	4.38 [64]	3.83 [97]
	3-1/2"	4.00 [102]	SWT22A21A			5.50 [140]	4.38 [25]	5.00 [127]	4.88 [124]	3.87 [98]
	4"	4.50 [114]	SWT22A22A			6.00 [152]	1.38 [35]	5.60 [142]	5.46 [139]	3.89 [99]
5"	3"	3.50 [48]	SWT24A20A	5"	5.56 [141]	4.72 [120]	1.38 [35]	4.30 [109]	4.40 [112]	4.33 [110]
	3-1/2"	4.00 [102]	SWT24A21A			5.50 [140]	1.38 [35]	5.00 [127]	4.86 [123]	4.41 [112]
	4"	4.50 [114]	SWT24A22A			6.00 [152]	1.38 [35]	5.60 [142]	5.46 [139]	4.41 [112]
	5"	5.56 [141]	SWT24A24A			7.38 [187]	1.62 [41]	6.84 [174]	6.64 [169]	4.66 [118]
6"	3"	3.50 [90]	SWT86A20A	6"	6.62 [168]	4.56 [116]	1.88 [48]	5.00 [127]	4.40 [112]	4.89 [124]
	3-1/2"	4.00 [102]	SWT86A21A			5.50 [140]	1.38 [35]	5.50 [140]	4.40 [112]	4.94 [125]
	4"	4.50 [114]	SWT86A22A			6.00 [152]	1.38 [35]	6.66 [169]	5.50 [140]	4.75 [121]
	5"	5.56 [141]	SWT86A24A			7.38 [187]	1.62 [41]	6.84 [174]	6.66 [169]	5.17 [131]
	6"	6.62 [168]	SWT86A86A			8.00 [203]	1.62 [41]	8.00 [203]	7.82 [199]	5.00 [127]

NOTES:
1. MATERIAL: CAST ALUMINUM ALLOY.
2. WELDING TO BE DONE BY THE CUSTOMER. FOR WELDING RECOMMENDATION SEE DRAWING SD73608.
3. DIMENSIONS IN BRACKETS [ ] ARE IN MILLIMETERS.

TYPE SWAT-A-A-30

WELDED V-CONNECTOR (30°)

Aluminum alloy streamlined, weld type A-frame connector, self-shielding at voltages up to 500 kV. Tap element sockets are deep enough to allow for error in cut-off. For standard (Schedule 40) and extra heavy (Schedule 80) Aluminum Tube. Other angles can be supplied.

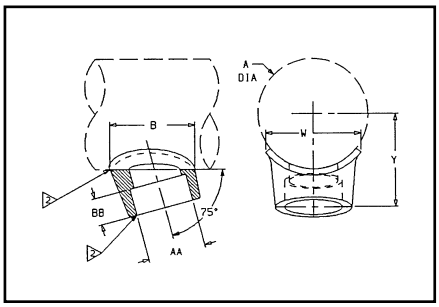


ALUMINUM TUBE		CATALOG NUMBER	B	B-B	W	Y	Z
RUN 'A'	TAP 'A-A'						
2" (2.375 DIA.)	1-1/4" (1.660 DIA.)	**SWAT18A16A-30**	3.25	1.00	4.81	3.19	1.76
	1-1/2" (1.900 DIA.)	**SWAT18A17A-30**	3.50	1.00	5.25	3.00	2.34
	2" (2.375 DIA.)	**SWAT18A18A-30**	4.00	1.00	6.30	3.12	3.46
2-1/2" (2.875 DIA.)	1-1/4" (2.375 DIA.)	**SWAT19A16A-30**	3.25	1.00	4.82	3.31	1.74
	1-1/2" (1.900 DIA.)	**SWAT19A17A-30**	3.50	1.00	5.25	3.28	2.004
	2" (2.375 DIA.)	**SWAT19A18A-30**	4.00	1.00	6.19	3.19	3.04
3" (3.500 DIA.)	1-1/2" (1.900 DIA.)	**SWAT20A17A-30**	3.50	1.00	5.12	3.44	1.87
	2" (2.375 DIA.)	**SWAT20A18A-30**	4.00	1.00	6.25	3.50	2.71
	2-1/2" (2.875 DIA.)	**SWAT20A19A-30**	4.38	1.38	7.19	3.88	3.41
3-1/2" (4.000 DIA.)	1-1/4" (2.375 DIA.)	**SWAT21A16A-30**	3.25	1.00	5.06	3.34	2.07
	1-1/2" (1.900 DIA.)	**SWAT21A17A-30**	3.50	1.00	5.25	3.44	1.97
	2" (2.375 DIA.)	**SWAT21A18A-30**	4.00	1.00	6.31	3.16	2.68
	2-1/2" (2.875 DIA.)	**SWAT21A19A-30**	4.38	1.38	7.38	4.00	3.09
	3" (3.500 DIA.)	**SWAT21A20A-30**	5.00	1.38	8.38	4.12	4.21
4" (4.500 DIA.)	2" (2.375 DIA.)	**SWAT22A18A-30**	4.00	1.00	6.50	3.81	2.82
	2-1/2" (2.875 DIA.)	**SWAT22A19A-30**	4.38	1.38	7.41	4.09	3.13
	3" (3.500 DIA.)	**SWAT22A20A-30**	5.12	1.38	8.62	4.28	4.05
5" (5.563 DIA.)	2" (2.375 DIA.)	**SWAT24A18A-30**	4.00	1.00	6.50	3.81	3.06
	2-1/2" (2.875 DIA.)	**SWAT24A19A-30**	4.38	1.38	7.38	4.47	2.87
	3" (3.500 DIA.)	**SWAT24A20A-30**	5.12	1.38	8.62	4.62	3.76
6" (6.625 DIA.)	3" (3.500 DIA.)	**SWAT86A20A-30**	5.12	1.38	8.69	4.81	3.57
	3-1/2" (4.000 DIA.)	**SWAT86A21A-30**	5.88	1.38	9.69	5.19	4.11
	4" (4.500 DIA.)	**SWAT86A22A-30**	6.25	1.38	10.62	5.00	5.15

TYPE SWT-A-A-75

WELDED T-CONNECTOR (75°)

Aluminum alloy streamlined, weld type A frame connector, self-shielding at voltages up to 500 kV. Tap element sockets are deep enough to allow for error in cut-off. For standard (Schedule 40) and extra heavy (Schedule 80) Aluminum Tube. Other angles can be supplied.



ALUMINUM TUBE				CATALOG NUMBER	DIMENSIONS IN / [mm]			
RUN		TAP						
NOMINAL	A	NOMINAL	AA		B	BB	W	Y
2"	2.38 [60.4]	1-1/4"	1.66 [42]	SWT18A16A-75	2.69 [68]	1.00 [25]	2.36 [60]	2.57 [65]
		1-1/2"	1.90 [48]	SWT18A17A-75	3.19 [81]	1.00 [25]	2.60 [66]	2.60 [66]
2-1/2"	2.88 [73]	1-1/4"	1.66 [42]	SWT19A16A-75	2.69 [68]	1.00 [25]	2.72 [69]	2.83 [72]
		1-1/2"	1.90 [48]	SWT19A17A-75	3.19 [81]	1.00 [25]	2.60 [66]	2.87 [73]
		2"	2.38 [60]	SWT19A18A-75	4.00 [102]	1.00 [25]	3.10 [79]	2.92 [74]
3"	3.50 [89]	1-1/2"	1.90 [48]	SWT20A17A-75	3.19 [81]	1.00 [25]	2.48 [63]	3.17 [81]
		2"	2.38 [60]	SWT20A18A-75	4.00 [102]	1.00 [25]	3.10 [79]	3.23 [82]
		2-1/2"	2.88 [73]	SWT20A19A-75	4.00 [102]	1.38 [35]	3.80 [97]	3.65 [93]
3-1/2"	4.00 [102]	1-1/4"	1.66 [42]	SWT21A16A-75	2.69 [68]	1.00 [25]	2.80 [71]	3.37 [86]
		1-1/2"	1.90 [48]	SWT21A17A-75	3.19 [68]	1.00 [25]	3.00 [76]	3.41 [87]
		2"	2.38 [42]	SWT21A18A-75	4.00 [68]	1.00 [25]	3.50 [89]	3.47 [88]
		2-1/2"	2.88 [73]	SWT21A19A-75	4.00 [68]	1.38 [35]	3.78 [96]	3.89 [99]
4"	4.50 [114]	2"	2.38 [60]	SWT22A18A-75	4.12 [105]	1.00 [25]	3.75 [95]	3.71 [94]
		2-1/2"	2.88 [73]	SWT22A19A-75	4.00 [102]	1.38 [35]	4.20 [107]	4.16 [106]
		3"	3.50 [89]	SWT22A20A-75	4.56 [116]	1.38 [35]	4.50 [114]	4.24 [108]
5"	5.56 [141]	2"	2.38 [60]	SWT24A18A-75	4.00 [102]	1.00 [25]	3.60 [91]	4.26 [108]
		2-1/2"	2.88 [73]	SWT24A19A-75	4.00 [102]	1.38 [35]	4.90 [124]	4.76 [121]
		3"	3.50 [89]	SWT24A20A-75	4.56 [116]	1.38 [35]	4.98 [126]	4.77 [121.2]
6"	6.62 [168]	3"	3.50 [89]	SWT86A20A-75	4.56 [116]	1.38 [35]	5.08 [129]	5.31 [135]
		3-1/2"	4.00 [102]	SWT86A21A-75	5.50 [140]	1.38 [35]	5.47 [139]	5.43 [138]
		4"	4.50 [114]	SWT86A22A-75	6.00 [152]	1.38 [35]	6.06 [154]	5.47 [139]

Notes:
1. Material: cast aluminum alloy
2. Welding to be done by customer.for welding recommendation see drawing SD73608
3. Dimensions in brackets [ ] are in millimeters.

TYPE WSLB-A

WELDED RIGID COUPLER

Aluminum alloy weld type coupler for joining equal sizes of tubing. Center stops provide the correct gap between the ends of the tubing during installation.

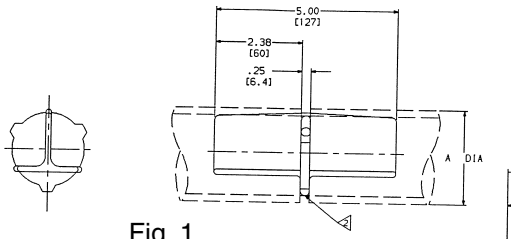


Fig. 1

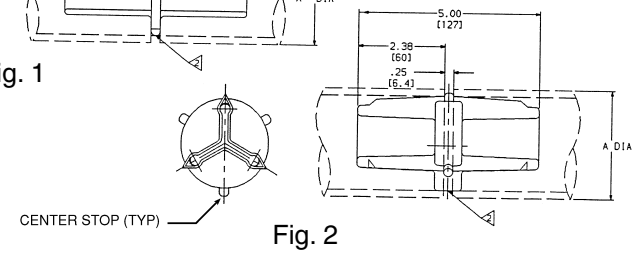


Fig. 2

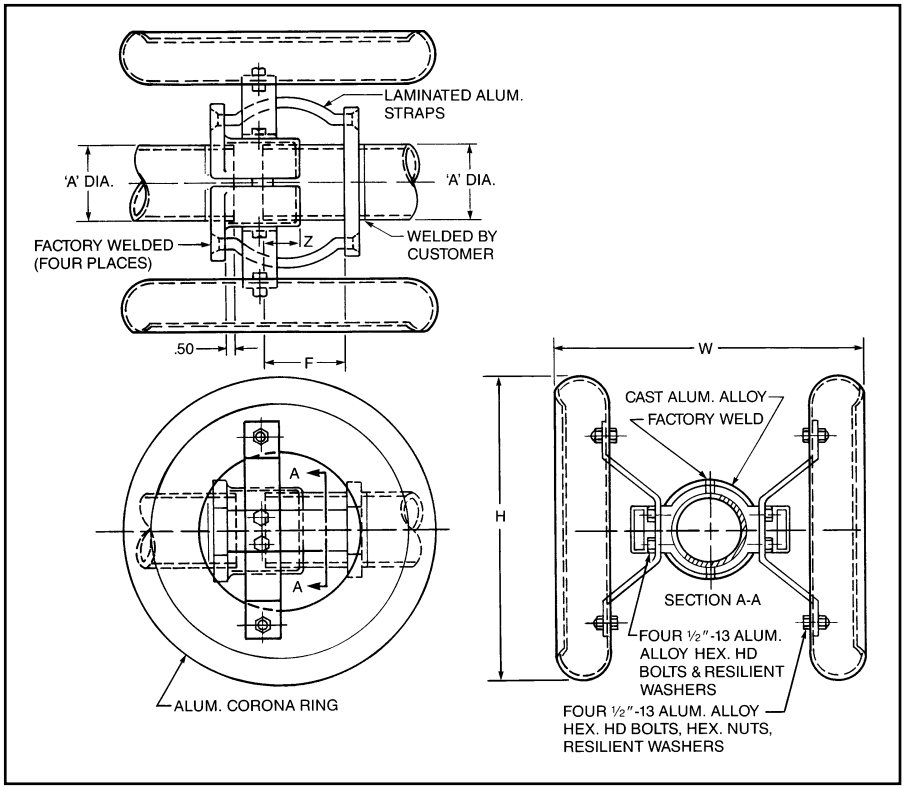
CONDUCTOR ALUMINUM TUBING SIZE	OD	CATALOG NUMBER	
		SCH. 40	SCH. 80
1"	1.32 [34]	**WSLB15A**	**WSLB55A**
1-1/4"	1.66 [42]	**WSLB16A**	**WSLB56A**
1-1/2"	1.90 [48]	**WSLB17A**	**WSLB57A**
2"	2.38 [60]	**WSLB18A**	**WSLB58A**
2-1/2"	2.88 [73]	**WSLB19A**	**WSLB59A**
3"	3.50 [89]	**WSLB20A**	**WSLB90A**
3-1/2"	4.00 [102]	**WSLB21A**	**WSLB91A**
4"	4.50 [114]	**WSLB22A**	**WSLB92A**
5"	5.56 [141]	**WSLB24A**	**WSLB94A**
6"	6.62 [168]	**WSLB86A**	**WSLB96A**

NOTES:
1. Material: cast aluminum alloy.
2. Welding to be done by the customer. For welding recommendation see drawing SD73608.
3. Dimensions in brackets [ ] are in millimeters.

TYPE SWXP-A-A

WELDED EXPANSION COUPLER

Aluminum alloy weld type expansion coupler for use at voltages up to 550 kV. Supplied complete with corona rings. Expansion element is laminated aluminum strap.



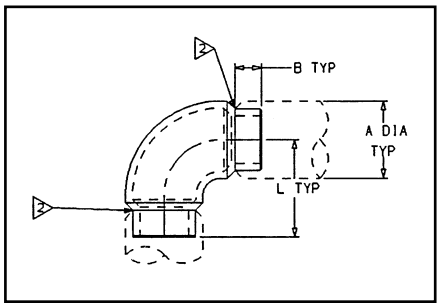
'A' DIA. ALUM. TUBE	CATALOG NUMBER SCH 40	CATALOG NUMBER SCH 80	F	H	W	TOTAL MOVEMENT ①
3" (3.500 DIA.)	**SWXP20A20A**	**SWXP90A90A**	5.25	22.00	17.05	3.00
4" (4.500 DIA.)	**SWXP22A22A**	**SWXP92A92A**	6.38	22.00	18.89	4.00
5" (5.563 DIA.)	**SWXP24A24A**	**SWXP94A94A**	7.88	26.00	19.25	4.00
6" (6.625 DIA.)	**SWXP86A86A**	**SWXP96A96A**	8.88	26.00	20.31	4.00

Note: ① Maximum movement per end equals one half of total movement specified in table.
2. Call factory for installation data.

TYPE SWL-A

WELDED 90° ELBOW

Aluminum alloy weld type angle coupler for use at voltages up to 550 kV. Chamfered ends for easy insertion.



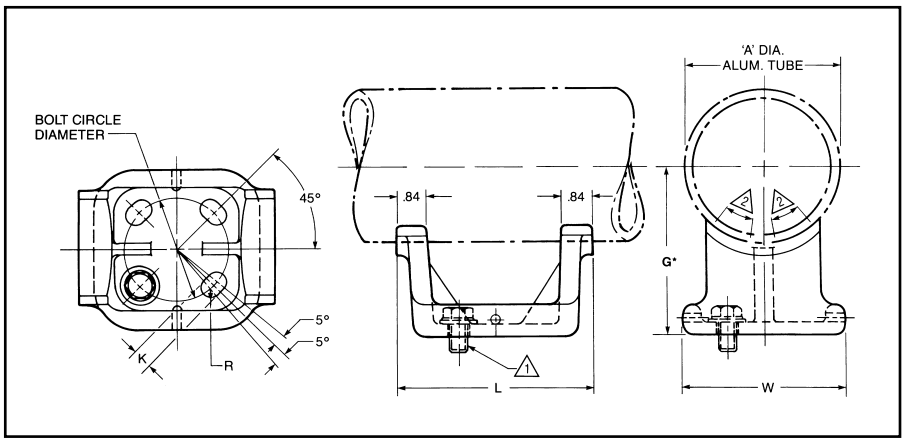
CONDUCTOR ALUMINUM TUBING SIZE	DIMENSIONS IN / [mm]			CATALOG NUMBER	
	A DIA.	B	L	SCH. 40	SCH. 80
2"	2.38 [60.4]	1.00 [25]	3.50 [89]	**SWL18A**	**SWL58A**
2-1/2"	2.88 [73]	1.38 [35]	3.88 [99]	**SWL19A**	**SWL59A**
3"	3.50 [89]		4.68 [119]	**SWL20A**	**SWL90A**
3-1/2"	4.00 [102]		5.12 [130]	**SWL21A**	**SWL91A**
4"	4.50 [114]		5.63 [143]	**SWL22A**	**SWL92A**
5"	5.56 [141]	1.62 [41]	6.16 [156]	**SWL24A**	**SWL93A**
6"	6.63 [168]		6.16 [156]	**SWL86A**	**SWL96A**

NOTES:
1. MATERIAL: CAST ALUMINUM ALLOY.
2. WELDING TO BE DONE BY THE CUSTOMER. FOR WELDING RECOMMENDATION SEE DRAWING SD73608.
3. DIMENSIONS IN BRACKETS [ ] ARE IN MILLIMETERS.

TYPE SWOH-A

WELDED RIGID BUS SUPPORT

Aluminum alloy streamlined, weld type, fixed bus support, self-shielding at voltages up to 550 kV when used on corona-free post type insulators. Supplied with galvanized steel mounting hardware. For standard (Schedule 40) and extra heavy (Schedule 80) aluminum tube.



A DIA. ALUM. TUBE	CATALOG NUMBER	BOLT CIRCLE DIA.	G*	K	L	W
2" (2.375 DIA.)	**SWOH18A-3**	3.00	2.75	.56	5.60	4.96
	SWOH18A-5	5.00		.69	7.48	6.76
2-1/2" (2.875 DIA.)	**SWOH19A-3**	3.00	3.12	.56	6.06	5.19
	SWOH19A-5	5.00		.69	7.62	6.80
3" (3.500 DIA.)	**SWOH20A-3**	3.00	3.00	.56	5.78	4.96
	SWOH20A-5	5.00		.69	7.20	6.29
3-1/2" (4.000 DIA.)	**SWOH21A-3**	3.00	4.00	.56	5.80	4.96
	SWOH21A-5	5.00		.69	7.58	6.76
4" (4.500 DIA.)	**SWOH22A-3**	3.00	4.50	.56	5.82	4.96
	SWOH22A-5	5.00		.69	7.68	6.57
5" (5.563 DIA.)	**SWOH24A-5**	5.00	5.00	.69	7.68	6.57
6" (6.625 DIA.)	**SWOH86A-5**	5.00	5.50	.69	7.68	6.57

* Conforms to NEMA standards.

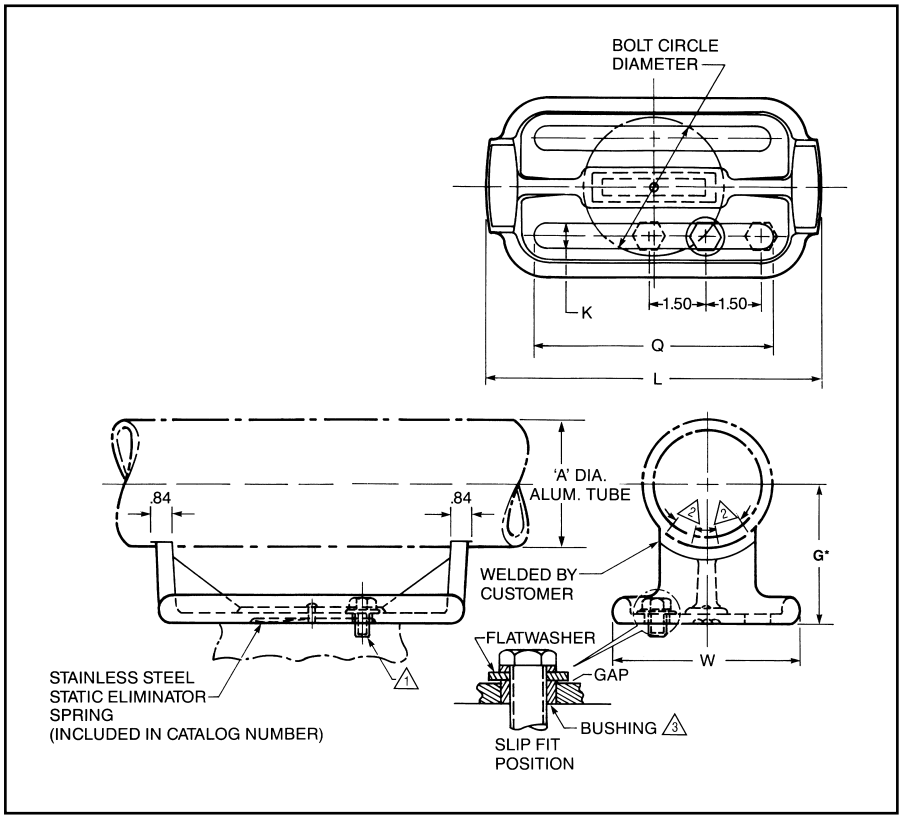
1 Cap mounting hardware is supplied as standard.

2 Minimum of 1.00" weld length.

TYPE SWSUH-A

WELDED SLIDE BUS SUPPORT

Aluminum alloy streamlined, weld type, sliding bus support, self-shielding at voltages up to 550 kV when used on corona-free post type insulators. Supplied with stainless steel electrical anti-chatter spring and galvanized, steel mounting hardware. For standard (Schedule 40) and extra heavy (Schedule 80) aluminum tube.



A DIA. ALUM. TUBE	CATALOG NUMBER	BOLT CIRCLE DIA.	G*	K	L	Q	W
2" (2.375 DIA.)	**SWSUH18A-3**	3.00	2.75	.81	8.75	5.94	5.00
	SWSUH18A-5	5.00		.88	10.62	7.11	6.75
2-1/2" (2.875 DIA.)	**SWSUH19A-3**	3.00	3.12	.81	8.75	5.94	5.00
	SWSUH19A-5	5.00		.88	10.62	7.42	6.75
3" (3.500 DIA.)	**SWSUH20A-3**	3.00	3.62	.81	8.75	5.94	5.00
	SWSUH20A-5	5.00		.88	10.62	7.42	6.75
3-1/2" (4.000 DIA.)	**SWSUH21A-3**	3.00	4.00	.81	8.75	5.94	5.00
	SWSUH21A-5	5.00		.88	10.62	7.42	6.75
4" (4.500 DIA.)	**SWSUH22A-3**	3.00	4.50	.81	8.75	5.94	5.00
	SWSUH22A-5	5.00		.88	10.62	7.42	6.75
5" (5.563 DIA.)	**SWSUH24A-5**	5.00	5.00	.88	10.62	7.42	6.75
6" (6.626 DIA.)	**SWSUH86A-5**	5.00	5.50	.88	10.62	7.42	6.75

* Conforms to NEMA standards.

1 Cap mounting hardware is supplied as standard.

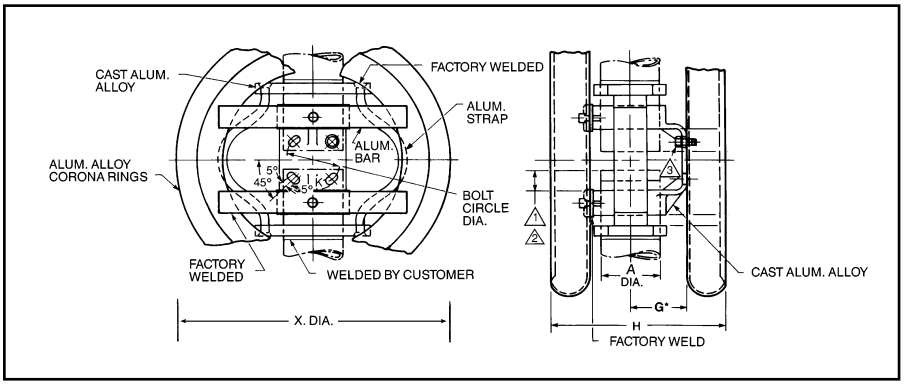
2 Minimum of 1.00" weld length.

3 Four aluminum alloy bushings are supplied for slip fit installations.

TYPE SWXHP-A

WELDED EXPANSION BUS SUPPORT COUPLER

Aluminum alloy weld type support coupler for use at voltages up to 550 kV. Supplied with corona rings and galvanized steel mounting hardware. Expansion element is laminated aluminum strap.



'A' DIA. ALUM. TUBE	CATALOG NUMBER	BOLT CIRCLE DIA.	G*	K	H	TOTAL MOVEMENT	X DIA.
2-1/2" (2.875 DIA.) SCH40	**SWXHP19A-5**	5.00	3.12	.69	12.77	3.00	26.00
2-1/2" (2.875 DIA.) SCH80	**SWXHP59A-5**	5.00	3.12	.69	12.77	3.00	26.00
3" (3.500 DIA.) SCH40	**SWXHP20A-5**	5.00	3.62	.69	13.62	3.00	26.00
3" (3.500 DIA.) SCH80	**SWXHP90A-5**	5.00	3.62	.69	13.62	3.00	26.00
3-1/2 (4.000 DIA.) SCH40	**SWXHP21A-5**	5.00	4.00	.69	14.25	3.00	26.00
4" (4.500 DIA.) SCH40	**SWXHP22A-5**	5.00	4.50	.69	14.90	4.00	26.00
4" (4.500 DIA.) SCH80	**SWXHP92A-5**	5.00	4.50	.69	14.90	4.00	26.00
5" (5.562 DIA.) SCH40	**SWXHP24A-5**	5.00	5.25	.69	16.31	4.00	26.00
5" (5.562 DIA.) SCH80	**SWXHP94A-5**	5.00	5.25	.69	16.31	4.00	26.00
6" (6.625 DIA.) SCH40	**SWXHP86A-5**	5.00	5.50	.69	17.34	4.00	26.00
6" (6.625 DIA.) SCH80	**SWXHP96A-5**	5.00	5.50	.69	17.34	4.00	26.00

* Conforms to NEMA standards.

1 Maximum movement per end equals one half of total movement specified in table.

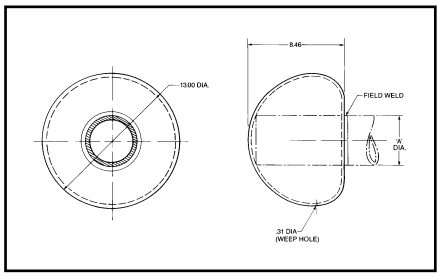
2 Refer to factory for specific installation data.

3 Cap mounting hardware is supplied as standard.

TYPE SCB-A

WELDED CORONA BELL

Aluminum alloy streamlined, self-shielding corona bells operate at voltages up to 550 kV. For standard (Schedule 40) and extra heavy (Schedule 80) tube.



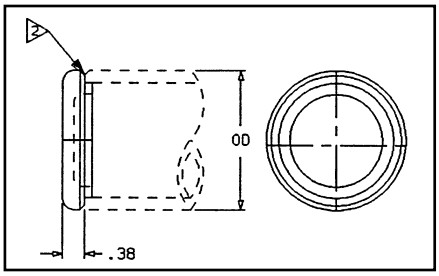
ACCOMMODATES 'A' DIA. ALUMINUM TUBE	CATALOG NUMBER
2-1/2 (2.875 DIA.)	**SCB19A**
3" (3.500 DIA.)	**SCB20A**
3-1/2" (4.000 DIA.)	**SCB21A**
4" (4.500 DIA.)	**SCB22A**
5" (5.563 DIA.)	**SCB24A**
6" (6.625 DIA.)	**SCB86A**

NOTE: For bolted design contact factory.

TYPE WLB-A

WELDED END PLUG

Aluminum weld type end plug for use in shielded EHV or HV applications. For standard (Schedule 40) and extra heavy (Schedule 80) tubing.



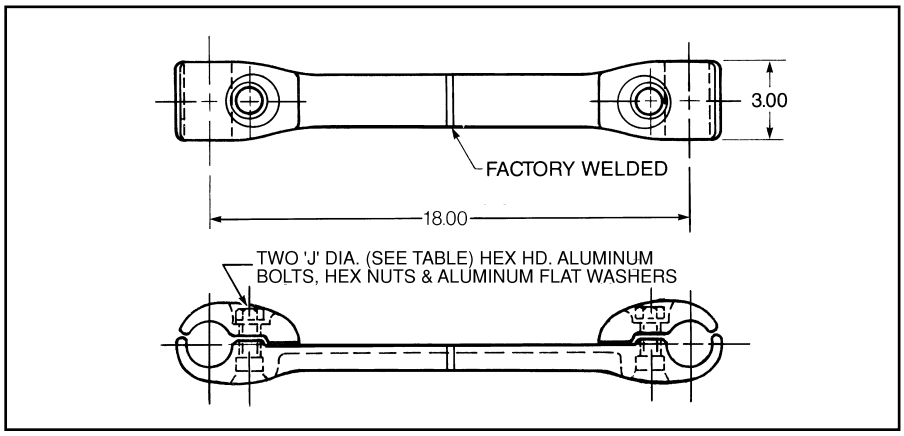
CONDUCTOR ALUMINUM TUBING SIZE	OD	CATALOG NUMBER	
		SCH. 40	SCH. 80
1"	1.32 [34]	**WLB15A**	**WLB55A**
1-1/4"	1.66 [42]	**WLB16A**	**WLB56A**
1-1/2"	1.90 [48]	**WLB17A**	**WLB57A**
2"	2.38 [60]	**WLB18A**	**WLB58A**
2-1/2"	2.88 [73]	**WLB19A**	**WLB59A**
3"	3.50 [89]	**WLB20A**	**WLB90A**
3-1/2"	4.00 [102]	**WLB21A**	**WLB91A**
4"	4.50 [114]	**WLB22A**	**WLB92A**
5"	5.56 [141]	**WLB24A**	**WLB94A**
6"	6.62 [168]	**WLB86A**	**WLB96A**

NOTES:
1. MATERIAL: CAST ALUMINUM ALLOY.
2. WELDING TO BE DONE BY THE CUSTOMER. FOR WELDING RECOMMENDATION SEE DRAWING SD73608.
3. DIMENSIONS IN BRACKETS [ ] ARE IN MILLIMETERS.

TYPE S2GBP-A

BUNDLED CABLE SPACER

Aluminum alloy streamlined bundled conductor spacer for two cables is self-shielding at voltages up to 550 kV. Rigid high-strength design. Conductors spaced on 18 inch centers. Contact factory for other spacings or bundling configurations.

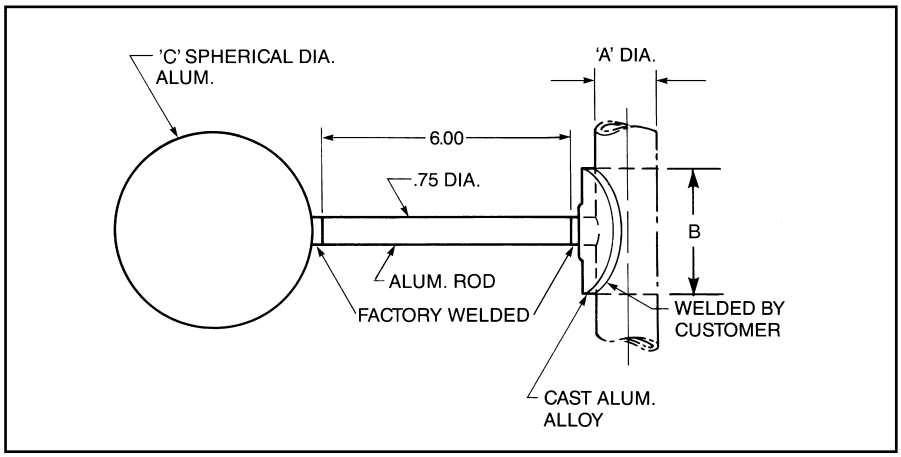


CATALOG NUMBER	CABLE RANGE		CABLE DIA.		'J' DIA.
	A.A.C.	A.C.S.R.	MIN.	MAX.	
S2GBP41A	795 MCM 37 STR. (1.0268 DIA.) -874.5 MCM 61 STR. (1.077 DIA.)	715.5 24/7 STR. (1.036 DIA.) -715.5 26/7 STR. (1.051 DIA.)	1.026	1.092	5/8" - 11
S2GBP44A	954 MCM 61 STR. (1.126 DIA.)	795 MCM 24/7 STR. (1.092 DIA.) 795 MCM 54/7 STR. (1.093 DIA.) 795 MCM26/7 STR. (1.108) 795 MCM 30/19 STR. (1.140 DIA.) 874 MCM 54/7 STR. (1.146 DIA.)	1.092	1.165	5/8" - 11
S2GBP445A	1033.5 MCM 37 STR. (1.170 DIA.) 1113 MCM 61 STR. (1.216 DIA.)	954 MCM 45/7 STR. (1.165 DIA.) 1033.5 MCM 45/7 STR. (1.213 DIA.)	1.165	1.246	5/8" - 11
S2GBP45A	1192 MCM 61 STR. (1.258 DIA.) 1272 MCM 61 STR. (1.300 DIA.)	1033.5 MCM 54/7 STR. (1.246 DIA.) 1192.5 MCM 54/19 STR. (1.333 DIA.)	1.246	1.382	5/8" - 11
S2GBP46A	1590 MCM 61 STR. (1.453 DIA.) 1600 MCM 127 STR. (1.454 DIA.)	1272 MCM 54/19 STR. (1.382 DIA.) 1431 MCM 54/19 STR. (1.465 DIA.)	1.382	1.504	5/8" - 11
S2GBP48A	1750 MCM 127 STR. (1.526 DIA.) 2000 MCM 91 STR. (1.630 DIA.)	1590 MCM 45/7 STR. (1.502 DIA.) 1750 MCM 84/19 STR. (1.602 DIA.)	1.504	1.632	5/8" - 11
S2GBP483A	2000 MCM 91 STR. (1.630 DIA.) 2250 MCM 91 STR. (1.729 DIA.)	1890 MCM 84/19 STR. (1.650 DIA.) 2167 MCM 72/7 STR. (1.737 DIA.)	1.632	1.737	5/8" - 11
S2GBP486A	2300 MCM 61 STR. (1.750 DIA.) 2500 MCM 127 STR. (1.823 DIA.)	2167 MCM 72/7 STR. (1.737 DIA.) 2156 MCM 84/19 STR. (1.762 DIA.)	1.737	1.824	5/8" - 11

TYPE SWCB-A

WELDED GROUND STUD

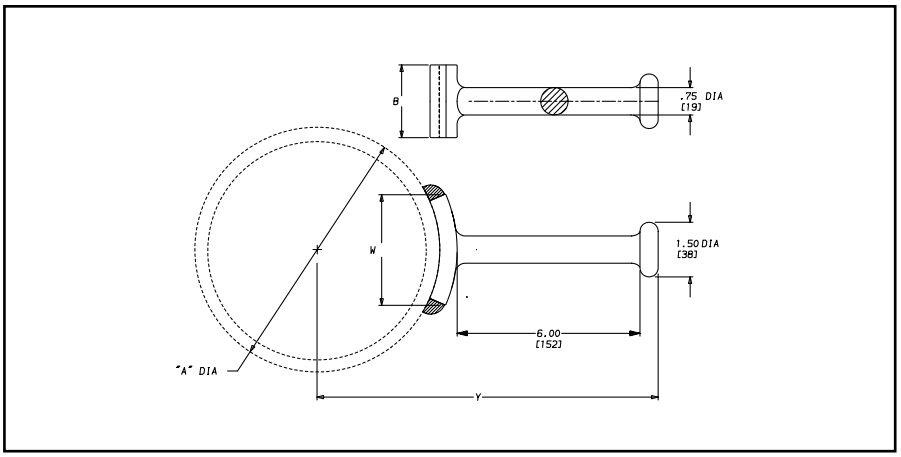
Streamlined weld type ground stud designed to be self-shielding at 550 kV.



CATALOG NUMBER	A DIA. ALUMINUM TUBE	C DIA.	B
SWCB19A	2-1/2" I.P.S. (2.875 DIA.)	9.00	1.50
SWCB20A	3" I.P.S. (3.500 DIA.)		3.00
SWCB22A	4" I.P.S. (4.500 DIA.)		4.00
SWCB24A	5" I.P.S. (5.563 DIA.)		
SWCB86A	6" I.P.S. (6.625 DIA.)		

TYPE WGA

WELDMENT GROUND STUD



CATALOG NUMBER	ALUM IPS	DIMENSIONS IN/(mm)			
		A	B	W	Y
WG19A	1" - 2-1/2"'	1.315 - 2.88 (33) - (73)	3.00 (76)	1.32 (34)	8.19 (208)
WG86A	3" - 6"	3.50 - 6.62 (89) - (168)	2.00 (51)	3.06 (78)	10.31 (262)

Dimensions in brackets [ ] are in millimeters

CONNECTORS

FOR OTHER APPLICATIONS

We have provided a collection of the most commonly used EHV connector types required for EHV substation construction. These connectors represent the basic Burndy line, which in most cases will be the only types required for a typical EHV installation.

It is recognized, however, that frequently, special designs are required that must meet the stringent electrical, mechanical & corona performance parameters of extra-high voltage applications. Burndy has supplied connectors for substation voltages up to 800 kV DC including the innovative “Seismic Bus.”

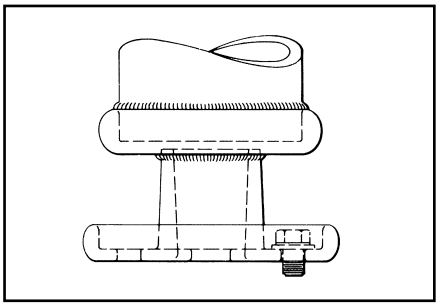
The following illustrations show only a few of the many additional varieties that are available from Burndy to meet these special requirements.

Contact your Burndy representative to discuss the details of availability and performance.

Bolted connectors for HV applications are described in Burndy’s Substation Connectors Catalog.

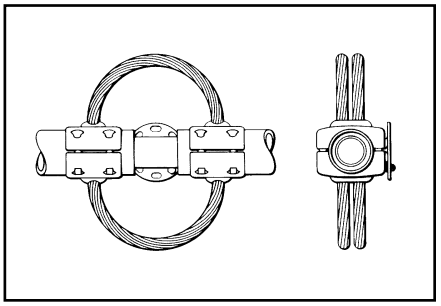
TYPE SWVH

Weld type vertical bus support for joining tubular aluminum bus in the same plane as the insulators. Streamlined, self-shielding at voltages up to 550 kV.



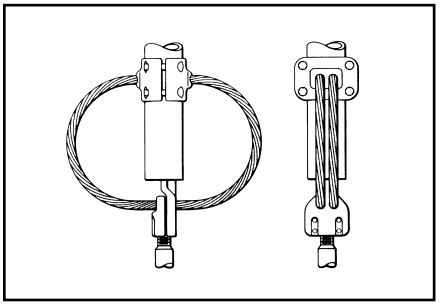
TYPE SXHP

Streamlined bolt type expansion bus support. Self-shielding at voltages up to 345 kV when used on corona-free post type insulators. Flexible element serves as corona shield and eliminates need for separate corona rings. Supplied with recessed aluminum alloy clamping hardware, stainless steel a



TYPE SXD

Streamlined, bolt type expansion stud connector self-shielding at voltages up to 345 kV. Recessed aluminum alloy hardware. Flexible element serves as corona shield and eliminates need for separate corona rings. Contact surfaces protected with oxide inhibitor.

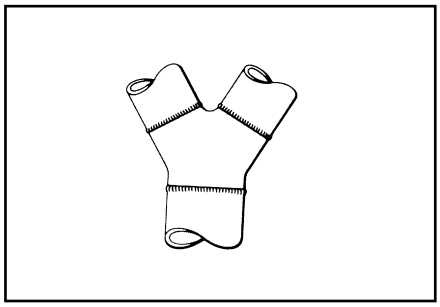


CONNECTORS

FOR OTHER APPLICATIONS (CONTINUED)

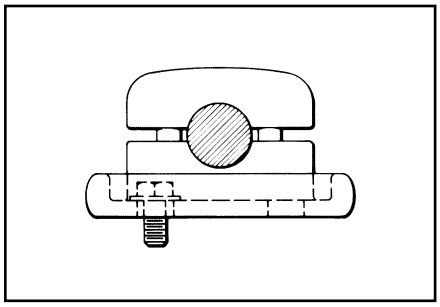
TYPE SWY

Streamlined WYE joint, welded, for tubular bus. Operates at voltages up to 550 kV.



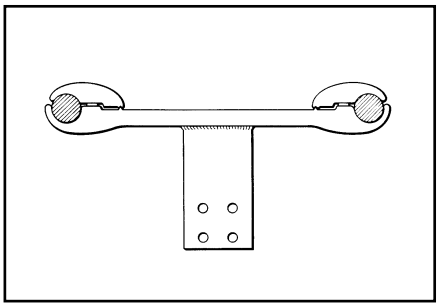
TYPE SUHG-A

Streamlined, rigid type bus support for cable. Self-shielding at voltages up to 550 kV when used on corona-free post type insulators.



TYPE S2GBP-G

Lightning arrestor terminal for joining any configuration of bundled cable to lightning arrestor leads. Use type STS streamline caps for shielding terminal hardware.



TYPE SN2D-G

Stud connector for joining two conductors at an angle to equipment bushings. Streamlined, self-shielding at voltages up to 550 kV.